

What is claimed is:

1. An exposure apparatus that exposes a substrate through a liquid, comprising:
 - at least two substrate stages each capable of holding and moving a substrate;
 - 5 an exposure station that exposes, through an optical system and the liquid, a substrate held by one substrate stage; and
 - a measuring station that measures the other substrate stage or the substrate held by said substrate stage; wherein,
 - the measurement at said measuring station is performed in a state in which the
 - 10 liquid has been disposed on said substrate stage or on said substrate.
2. An exposure apparatus according to claim 1, wherein the measurement at said measuring station is performed during the exposure at said exposure station.
- 15 3. An exposure apparatus according to claim 1 or 2, wherein
 - the substrate on the substrate stage that was measured at said measuring station is exposed at said exposure station;
 - said measuring station comprises a surface detection system that measures, through the liquid, the surface information of the substrate held by said substrate stage;
 - 20 and
 - the surface position of the substrate at said exposure station is compensated based on the results of the measurement performed at said measuring station.
4. An exposure apparatus according to any one of claims 1 to 3, wherein
- 25 said exposure station comprises a first liquid supply mechanism that supplies the

liquid between said optical system and the substrate; and

said measuring station comprises: a dummy member comprising a liquid contact surface substantially equivalent to the liquid contact surface of said optical system; and a second liquid supply mechanism that supplies the liquid between said dummy member
5 and said substrate.

5. An exposure apparatus according to any one of claims 1 to 4, further comprising:

a measuring instrument that measures the force exerted by said liquid upon said substrate or the substrate stage that holds said substrate.

10

6. An exposure apparatus according to claim 5, wherein the surface position of said substrate at the exposure station is compensated based on the measurement result of said measuring instrument.

15 7. An exposure apparatus according to claim 6, wherein said measuring instrument comprises a control apparatus that measures the force exerted on said substrate at each of a plurality of positions, in a state in which the liquid has been disposed, and derives the surface information of said substrate based on said measurement result.

20 8. An exposure apparatus according to claim 6, wherein

a first surface information related to said substrate is derived by performing a measurement, in a state in which the liquid has been disposed on the substrate, with the measuring instrument at said measuring station;

a second surface information related to said substrate is derived by performing a
25 measurement, in a state in which the liquid has been disposed on said substrate, with the

measuring instrument at said exposure station; and

a compensation quantity for compensating the surface position of said substrate at said exposure station is determined based on said first surface information and said second surface information.

5

9. An exposure apparatus according to any one of claims 1 to 8, wherein
a liquid immersion area is formed at one part on said substrate; and
the surface information of said substrate is derived in accordance with the position of said immersion area in the surface direction of said substrate.

10

10. An exposure apparatus according to any one of claims 1 to 9, wherein said measuring station comprises a first mark detection system that measures, through the liquid, an alignment mark on the substrate held by the substrate stage and also measures, through the liquid, a fiducial mark provided on said substrate stage.

15

11. An exposure apparatus according to claim 10, wherein
said first mark detection system comprises an optical member comprising a liquid contact surface substantially equivalent to the liquid contact surface of said optical system; and

20

measurement is performed in a state in which the liquid is brought into contact with the liquid contact surface of said optical member.

12. An exposure apparatus according to claim 10 or 11, wherein said first mark detection system and the surface detection system that measures the surface information of said substrate are capable of performing measurement substantially simultaneously.

25

13. An exposure apparatus according to any one of claims 10 to 12, wherein

said exposure station comprises a second mark detection system that measures,
through the optical system and the liquid, the fiducial mark provided on said substrate
5 stage; and

a shot region on said substrate and the position of a pattern image that passed
through said optical system and the liquid are aligned based on the measurement results
of said first mark detection system and said second mark detection system.

10 14. A device fabricating method, wherein the exposure apparatus according to any one
of claims 1 to 13 is used.

15. An exposure method that exposes a substrate through a liquid, comprising the steps
of:

15 measuring the substrate stage or the substrate held by said substrate stage at the
measuring station in a state in which the liquid is disposed on the substrate stage or the
substrate; and

exposing, through the optical system and the liquid, said substrate at an exposure
station separate from said measuring station.

20

16. An exposure method according to claim 15, comprising the steps of:

measuring the surface information of said substrate at said measuring station;
and

exposing the substrate ,while compensating the surface position of the substrate,
25 at said exposure station based on said measurement results.

17. An exposure method according to claim 15 or 16, further comprising the steps of:

measuring, through said optical system and the liquid, the fiducial mark
provided on said substrate stage at said exposure station after the alignment mark on the
5 substrate held on said substrate stage at said measuring station has been measured
through the liquid, and the fiducial mark provided on said substrate stage has been
measured through the liquid; and

aligning the shot region on said substrate and the position of the pattern image,
which passed through said optical system and the liquid, based on said measurement
10 results.

18. An exposure method according to any one of claims 15 to 17, wherein the
measurement at said measuring station is performed during the exposure at said exposure
station.

15

19. A device fabricating method, wherein the exposure method according to any one of
claims 15 to 18 is used.

20. An exposure apparatus that exposes a substrate through a liquid, comprising:

20 at least two substrate stages capable of holding and moving a substrate;
an exposure station that exposes, through an optical system and the liquid, the
substrate held by one substrate stage;

a measuring station that measures the other substrate stage or the substrate held
by said substrate stage;

25 a first liquid supply apparatus that supplies the liquid on the substrate held by

said substrate stage positioned at said exposure station; and

a second liquid supply apparatus that supplies the liquid on said substrate stage or the substrate held by said substrate stage positioned at said measuring station.